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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/887,642	06/22/2001	J. Scott Buchanan	2001B052	7135
23455	7590	11/01/2004	EXAMINER	
EXXONMOBIL CHEMICAL COMPANY P O BOX 2149 BAYTOWN, TX 77522-2149			STOCKTON, LAURA LYNNE	
			ART UNIT	PAPER NUMBER
			1626	

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/887,642	BUCHANAN ET AL.	
	Examiner	Art Unit	
	Laura L. Stockton, Ph.D.	1626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2004 and 05 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 55-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 55-57 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-13 and 55-57 are pending in the application.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 8, 2004 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this

Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13 and 55-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chem Systems {"Developments in Dimethyl Carbonate Production Technologies" 99/00S6, May 2000} and Buysch et al. {U.S. Pat. 4,434,105}, each in combination with each other and in view of Lichtenwalter et al. {U.S. Pat. 2,773,070}, McClellan {U.S. Pat. 2,873,282}, Raines et al. {U.S. Pat. 4,233,221} and Pacheco et al. {U.S. Pat. 5,489,703}.

Determination of the scope and content of the prior art (MPEP §2141.01)

Applicants claim a process of making dialkyl carbonate and a diol (e.g., ethylene glycol) from alkylene oxide (e.g., ethylene oxide), carbon dioxide and an aliphatic monohydric alcohol (e.g., methanol and ethanol) comprising (a) reacting an alkylene oxide with carbon dioxide in the presence of a homogeneous carbonation catalyst (e.g., quaternary ammonium halides and alkali halides) to provide a crude cyclic carbonate; (b) directing crude cyclic carbonate stream into a second reaction zone; and (c) reacting said cyclic carbonate with an aliphatic monohydric alcohol in the presence of said homogeneous carbonation catalyst, wherein the carbonation catalyst of steps (a) and (c) has a halide component and a bicarbonate component.

Chem Systems 99/00S6 (May 2000) {pages 26-31} teach a process of making dialkyl carbonate (e.g., dimethyl carbonate)

and a diol (e.g., ethylene glycol) from alkylene oxide (e.g., ethylene oxide), carbon dioxide and an aliphatic monohydric alcohol (e.g., methanol) comprising (a) reacting an alkylene oxide with carbon dioxide in the presence of a homogeneous carbonation catalyst (e.g., tetraethylammonium bromide and potassium iodide) to provide a crude cyclic carbonate and (b) reacting said cyclic carbonate with an aliphatic monohydric alcohol (e.g., methanol) in the presence of said homogeneous carbonation catalyst, such as a quaternary ammonium halides and alkali halides.

Buysch et al. '105 teach a process of making dialkyl carbonate (e.g. dimethyl carbonate) and a diol (e.g., glycol) by reacting alkylene oxides (e.g., ethylene oxide) with aliphatic and/or cycloaliphatic alcohols (e.g., methanol) and carbon dioxide in the presence of catalysts, such as sodium iodide,

thallium carbonate, tetraethylammonium bromide or mixtures thereof (column 1, lines 45-68; column 2, lines 34-38 and lines 60-68; column 3, lines 1-23; and Examples 1, 7, 11 and 12).

Additionally, Buysch et al. '105 (column 2, lines 37 and 47; Example 1 in column 3; Example 7 in column 4) teach carbonates of alkali metals (e.g., K_2CO_3) and thallium compounds (e.g., Tl_2CO_3). Buysch et al. '105 (column 2, lines 63-66) also teach that the catalyst can be made of mixtures of compounds such as salts of organic nitrogen compounds; oxides, hydroxides and salts of alkali metals; oxides, hydroxides and salts of alkali earth metals; etc.

Ascertainment of the difference between the prior art and the claims (MPEP §2141.02)

The difference between the processes of the prior art and the process instantly claimed is that the prior art teach the

addition of all ingredients at once instead of sequentially in two reaction zones as instantly claimed and the absence of a bicarbonate component in the catalyst of step (a) and (c).

Finding of prima facie obviousness--rational and motivation (MPEP §2142-2413)

The addition of ingredients sequentially, as instantly claimed, instead of simultaneously, as taught in the prior art, is *prima facie* obvious because one skilled in the art would expect to obtain a dialkyl carbonate and a diol.

Further, Raines et al. teach that the preparation of alkylene carbonates by reacting an alkylene oxide and carbon dioxide is well known (column 1, lines 5-14). Raines et al. also teach known catalysts (e.g., bicarbonates of tertiary amines, sodium bicarbonate, etc.) that catalyze this reaction (column 1, lines 15-28).

Lichtenwalter et al. (column 1, lines 11-17 and 40-62; column 2, lines 64-70; and Example 1 in column 3) teach ammonium halide catalysts which are used in the production of alkylene carbonates by the reaction of alkylene oxides with carbon dioxide.

Pacheco et al. (column 7, lines 14-43) teach the interchangeability of sodium hydroxide, sodium carbonate, quaternary ammonium carbonate and quaternary ammonium halide catalysts to catalyze the production of alkylene carbonates by the reaction of alkylene oxides with carbon dioxide.

McClellan (column 1, lines 15-20 and 35-72; column 2, lines 1-9; and Example 1 in column 3) teach the interchangeability of ammonium hydroxide, ammonium carbonate and ammonium bicarbonate catalysts (see

definition of Y variable in column 1, lines 52-53), which is used in the production of alkylene carbonates by the reaction of alkylene oxides with carbon dioxide.

Therefore, the claimed process is no more than a selective combination of prior art teachings done in a manner obvious to one of ordinary skill in the art since each step of the process appears to be relatively complete in itself and there is no indication of an interaction between steps of such a type that would lead one of ordinary skill in the art to doubt that a substitution of alternative steps known to the art could be made. *In re Mostovych*, 144 USPQ 38 (1964).

One skilled in the art would have been motivated to utilize the processes taught by the prior art to arrive at the instant claimed process with the expectation of obtaining a dialkyl carbonate and a diol. The instant claimed process would have

been suggested to one skilled in the art and therefore, the instant claimed process would have been obvious to one skilled in the art.

Response to Arguments

Applicants' arguments filed September 8, 2004 and October 5, 2004 have been fully considered. Applicants argue that: (1) the prior art teaches the addition of all ingredients at once instead of sequentially; and (2) the prior art fails to teach or suggest a catalyst system comprised of a mixture of a halide containing component and a bicarbonate.

All of Applicants' arguments have been considered but have not been found persuasive. Each of Chem Systems and Buysch et al. '105 teach a process of making dialkyl carbonate and a diol. The only difference is the prior art teaches a single

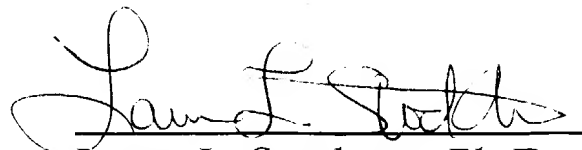
reaction zone whereas Applicants are claiming two reaction zones. Applicants have not demonstrated in a side-by-side showing of unexpected, beneficial and superior results of the instant claimed process over the processes taught in the prior art by adding the ingredients sequentially versus all at once.

Absent such showing, the instant claimed invention is found to have been obvious to one of ordinary skill in the art. Further, as shown in the teachings of Buysch et al. '105, Lichtenwalter et al., McClellan, Raines et al. and Pacheco et al., it is known that the catalyst for making alkylene carbonates by the reaction of alkylene oxides with carbon dioxide can contain a halide and/or a bicarbonate component. Therefore, the instant claimed invention would have been obvious to one skilled in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura L. Stockton whose telephone number is (571) 272-0710. The examiner can normally be reached on Monday-Friday from 6:15 am to 2:45 pm. If the examiner is out of the Office, the examiner's supervisor, Joseph McKane, can be reached on (571) 272-0699.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

The Official fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

A handwritten signature in black ink, appearing to read "Laura L. Stockton", written over a horizontal line.

Laura L. Stockton, Ph.D.
Patent Examiner
Art Unit 1626, Group 1620
Technology Center 1600

October 28, 2004